



# basic education

---

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1**

**FEBRUARY/MARCH 2015**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 11 pages.**

**PRINCIPLES RELATED TO MARKING LIFE SCIENCES**

1. **If more information than marks allocated is given**  
Stop marking when maximum marks is reached and put a wavy line and 'max' in the right hand margin.
2. **If, for example, three reasons are required and five are given**  
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If whole process is given when only part of it is required**  
Read all and credit relevant part.
4. **If comparisons are asked for but descriptions are given**  
Accept if differences/similarities are clear.
5. **If tabulation is required but paragraphs are given**  
Candidates will lose marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required**  
Candidates will lose marks.
7. **If flow charts are given instead of descriptions**  
Candidates will lose marks.
8. **If sequence is muddled and links do not make sense**  
Where sequence and links are correct, credit. Where sequence and links is incorrect, do not credit. If sequence and links becomes correct again, resume credit.
9. **Non-recognized abbreviations**  
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.
10. **Wrong numbering**  
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable. Indicate that the candidate's numbering is wrong.
11. **If language used changes the intended meaning**  
Do not accept.
12. **Spelling errors**  
If recognizable accept provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**  
Accept, provided it was accepted at the National memo discussion meeting.

14. **If only the letter is asked for but only name is given (and vice versa)**  
No credit.
15. **If units are not given in measurements**  
Memorandum will allocate marks for units separately, except where it is already given in the question.
16. Be sensitive to **the sense of an answer, which may be stated in a different way.**
17. **Caption**  
Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.
18. **Code-switching of official languages (terms and concepts)**  
A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.
19. **Changes to the memorandum**  
No changes must be made to the marking memoranda. In exceptional cases, the Provincial Internal Moderator will consult with the National Internal Moderator (and the External moderators if necessary).
20. **Official memorandum**  
Only memoranda bearing the signatures of the National Internal Moderator and the UMALUSI moderators and distributed by the National Department of Basic Education via the provinces must be used.

**SECTION A****QUESTION 1**

1.1	1.1.1	B✓✓		
	1.1.2	C✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	B✓✓		
	1.1.6	C✓✓		
	1.1.7	C✓✓		
	1.1.8	D✓✓		
	1.1.9	B✓✓		
	1.1.10	C✓✓	(10 x 2)	<b>(20)</b>
1.2	1.2.1	Eustachian tube✓		
	1.2.2	Carbon footprint✓		
	1.2.3	Thermal✓ pollution		
	1.2.4	Aqueous humour✓		
	1.2.5	Oestrogen✓		
	1.2.6	Luteinising hormone✓/LH		
	1.2.7	Cristae✓		
	1.2.8	TSH✓/Thyroid-stimulating hormone		
	1.2.9	Internal✓ fertilisation		
	1.2.10	Accommodation✓	(10 x 1)	<b>(10)</b>
1.3	1.3.1	B only✓✓		
	1.3.2	B only✓✓		
	1.3.3	A only✓✓		
	1.3.4	B only✓✓		
	1.3.5	None ✓✓		
	1.3.6	A only✓✓	(6 x 2)	<b>(12)</b>
1.4	1.4.1	Spermatogenesis✓		(1)
	1.4.2	Testis✓		(1)
	1.4.3	(a) 23✓ (b) 23✓		(1) (1)
	1.4.4	- Crossing over✓ - Random assortment of chromosomes✓ <b>(Mark first TWO only)</b>	(any order)	(2)
	1.4.5	2✓		(1)
	1.4.6	Sperm cells✓/spermatozoa/male gametes		(1) <b>(8)</b>

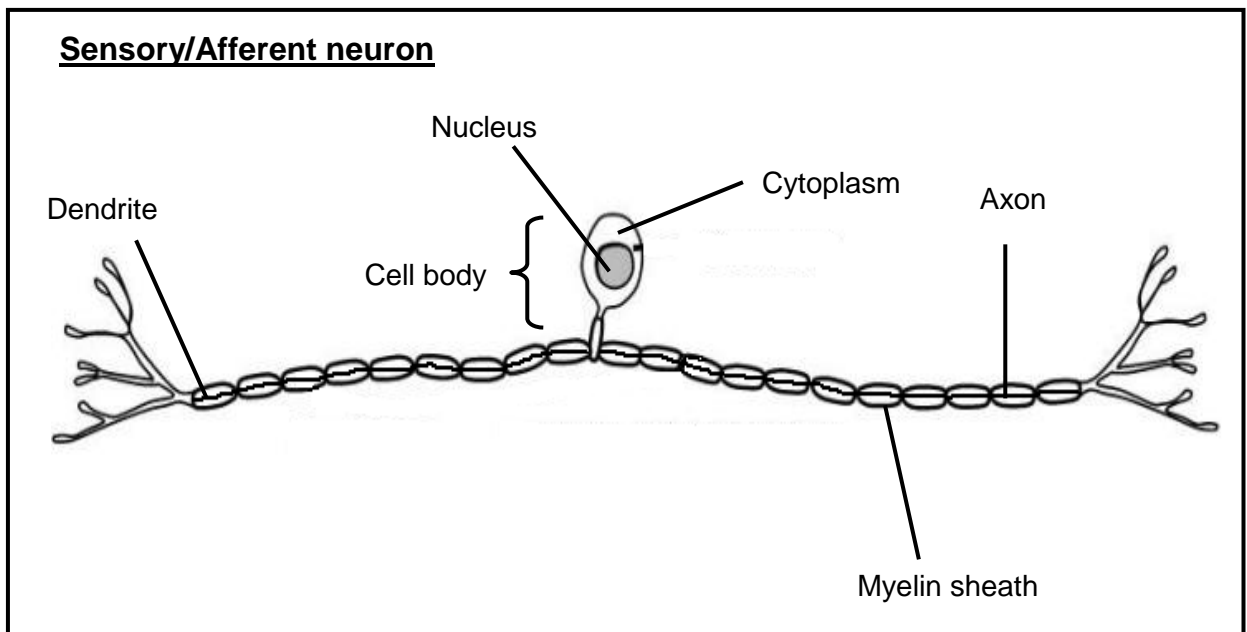
**TOTAL SECTION A: 50**

## SECTION B

## QUESTION 2

- |     |   |   |                                 |
|-----|---|---|---------------------------------|
| 2.1 | 2.1.1   | (a) Epididymis✓<br>(b) Testis✓<br>(c) Vas deferens✓/sperm duct  | (1)<br>(1)<br>(1)               |
|     | 2.1.2   | Stores sperm cells✓<br><b>(Mark first ONE only)</b>   | (1)                             |
|     | 2.1.3   | Sperm cells will not pass to urethra✓<br>to fertilise the egg✓<br>and hence he will not be able to have children✓ | (3)                             |
|     | 2.1.4   | The HI virus may still be passed on✓ during sexual intercourse<br>through the secretions of the accessory glands✓ | (2)<br><b>(9)</b>               |
| 2.2 | <ul style="list-style-type: none"> <li>- Sound waves are directed by the pinna✓</li> <li>- through the auditory canal✓</li> <li>- to the tympanic membrane✓/ eardrum</li> <li>- causing it to vibrate✓</li> <li>- The vibrations of the tympanic membrane are transferred to the ossicles✓ in the middle ear</li> <li>- which eventually causes the oval window to vibrate✓</li> <li>- This sets up pressure waves in the perilymph✓</li> <li>- Pressure waves are then transferred to the endolymph✓ in the cochlea</li> <li>- This stimulates the Organ of Corti✓</li> <li>- in the cochlea✓</li> <li>- to convert this stimulus into a nerve impulse✓</li> <li>- <b>*which is then transported along the auditory nerve✓</b></li> <li>- <b>*to the cerebrum✓</b></li> <li>- <b>*where the sound is interpreted✓</b></li> </ul> |   | Any 4+3* (compulsory marks) (7) |

- 2.3 2.3.1 A reflex action is a rapid✓, automatic response✓ to a stimulus. (2)
- 2.3.2 (a) Synapse✓ (1)  
(b) Inter-neuron✓/connector neuron (1)
- 2.3.3 It ensures that the impulse moves in one direction only✓  
It prevents continuous stimulation of the neurons✓  
It ensures that the impulse is transmitted from the sensory neuron to the motor neuron✓ Any (1)
- 2.3.4 A → B → C (2)
- 2.3.5 - The person will be able to receive a stimulus✓  
- but will not be able to respond to it✓ (2)
- 2.3.6



CRITERION	MARKS ALLOCATION
Caption	1 mark
Any 4 labels	4 marks

(5)  
(14)

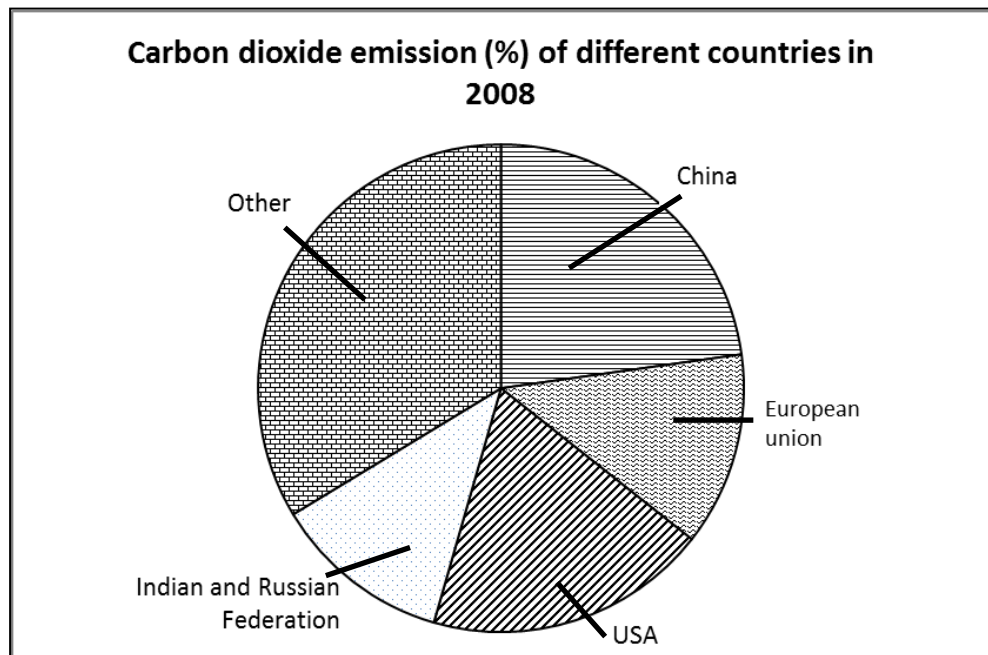
- 2.4 2.4.1 0.25✓ g/cm<sup>3</sup> (1)
- 2.4.2 15✓ minutes (1)
- 2.4.3 - Blood glucose level of a person with diabetes mellitus is higher✓ than that of a normal person at all times✓  
- There is a greater increase in the blood glucose level of a person with diabetes mellitus after ingestion of glucose✓ compared to the normal person✓  
- It takes longer for the blood glucose level to stabilise for the person with diabetes mellitus✓ compared to a normal person✓ Any (2x2) (4)  
**(Mark first TWO only)**
- 2.4.4 - Because the person with diabetes mellitus does not produce insulin✓/is insulin resistant  
- therefore blood glucose is not converted to glycogen✓ (2)
- 2.4.5 - Glucagon✓  
- Adrenalin✓ (2)  
**(Mark first TWO only)** (10)  
[40]

**QUESTION 3**

- 3.1 3.1.1 The process by which the human body is able to maintain a constant✓internal environment✓ (2)
- 3.1.2 (a) Kidney✓ (1)  
(b) Adrenal✓ gland (1)  
(c) Aldosterone✓ (1)
- 3.1.3 - Walls of renal tubules✓  
- become more permeable✓  
- allowing for a greater re-absorption of sodium ions✓  
- from the filtrate✓/into the blood capillaries Any (2)  
**(7)**
- 3.2 3.2.1 Low number of species✓/low biodiversity (1)
- 3.2.2 - Addition of phosphates caused eutrophication✓  
- which led to an increase in algal growth✓ / algal bloom  
- which depleted the oxygen in the water✓  
- thus reducing its ability to support ✓a variety of life-forms Any (3)
- 3.2.3 - The length of food chains will be reduced✓/complexity of food webs will be reduced  
- resulting in organisms feeding on the remaining species having  
- excess food✓  
- leading to their overpopulation✓  
- while organisms depending on the species that were lost will  
- have less✓/no food available  
- leading to their death✓/migration Any (4)
- 3.2.4 - The use of living organisms✓  
- to control the numbers✓ of other organisms (2)  
**(10)**



- 3.3 3.3.1 China:  $23/100 \times 360^0 = 82.8^0$
- European Union:  $13/100 \times 360^0 = 46.8^0$
- USA:  $19/100 \times 360^0 = 68.4^0$
- India and Russian Federation:  $12/100 \times 360^0 = 43.2^0$
- Other:  $33/100 \times 360^0 = 118.8^0$



Correct type of graph	1 mark
Caption	1 mark
Correct calculations	1: 1–4 calculations correct 2: All 5 calculations correct
Correct proportion and labelling sectors	1: 1–3 sectors correct 2: 4–5 sectors correct

**NOTE:** If the wrong type of graph is drawn: marks will be awarded for 'caption only' (6)

- 3.3.2
- Leads to the enhanced 'greenhouse effect' ✓
  - and thus global warming ✓
  - Global warming influences the weather patterns ✓
  - which can destroy habitats ✓
  - leading to a decrease in biodiversity ✓
- Any (3)

- 3.3.3 - It will be expensive✓ to change to machinery that produce less CO<sub>2</sub>✓  
 - Too expensive✓ to purchase or develop systems that remove excess CO<sub>2</sub> from outlet gases✓  
 - This will reduce profit✓ that will lead to job losses✓/ have negative effect on the country's economy  
**(Mark first TWO only)** Any (2x2) (4)  
**(13)**
- 3.4 3.4.1 Treatment✓ of plant shoot (1)
- 3.4.2 - Same type of plant✓  
 - Placed in the same environment✓  
 - Same amount of time✓  
 - Tip removed at the same length✓  
 - Same concentration of auxins✓  
 - Same type of agar✓  
**(Mark first TWO only)** Any (2)
- 3.4.3 (a) - Shoot B would show upward growth✓  
 - Auxins in the agar gel diffused downwards✓ into the shoot  
 - leading to cell elongation✓ (3)
- (b) - No growth in shoot C✓  
 - Shoot tip contains NO auxins✓ (2)
- 3.4.4 - Repeat the investigation✓  
 - Use more than 1 plant per investigation✓/increase sample size  
**(Mark first TWO only)** Any (2)  
**(10)**  
**[40]**

**TOTAL SECTION B: 80**

**SECTION C****QUESTION 4**

- The zygote divides by mitosis✓
- to form a ball of cells✓
- called the morula✓
- More mitotic divisions of the morula occurs to form a hollow ball of cells✓
- called a blastocyst✓
  
- The blastocyst attaches to the endometrial lining✓
- The outer wall of the blastocyst, called the chorion✓,
- develops projections called villi✓ which
- embeds/implants✓ into the uterine wall
  
- The cells of the embryo continues to divide✓
- and differentiate✓
- to form the different organs and limbs✓
- and is now called a foetus✓
- The foetus is enclosed in a sac called the amnion✓
- filled with amniotic fluid✓
- which protects the foetus against temperature fluctuations✓
- protects the foetus against dehydration✓
- and protects the foetus against mechanical injury✓/acts as a shock absorber
  
- The chorionic villi and the endometrium form the placenta✓
- where the blood of both the foetus and the mother✓
- run close to each other✓
- allowing for nutrients to diffuse✓ into the blood of the foetus
- The umbilical vein✓
- carries the absorbed nutrients from the mother to the foetus✓

Any (17)

Content: (17)  
Synthesis: (3)**ASSESSING THE PRESENTATION OF THE ESSAY**

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSIVE
All information provided is relevant to the topic	Ideas arranged in a logical/ cause-effect sequence	Answered all aspects required by the essay
Only information relating to the development of the zygote to the foetus and its nutrition and protection is included (there is no irrelevant information)	Events that lead to the change from a zygote to a foetus are stated in the order in which they occur	ALL three aspects are included: 1. Development of zygote to foetus 2. Nutrition of the foetus 3. Protection of the foetus
1 mark	1 mark	1 mark

**TOTAL SECTION C: 20**  
**GRAND TOTAL: 150**